

SEQUENCE LISTING

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Iwama, Atsushi

<120> EXPANSION AGENTS FOR STEM CELLS

<130> 790086.406USPC

<140> US 10/534,386

<141> 2003-10-23

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<151> 2003-10-23

<150> JP 2002-326190

<151> 2002-11-08

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<170> PatentIn version 3.1

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Gln	Met	Gln	Val	Leu	Tyr	Gly	Gln	His	Phe	Pro	Ile	Glu	Val	Arg	His	
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tac	ttg	gcc	cag	tgg	att	gag	agc	cag	cca	tgg	gat	gcc	att	gac	ttg	144
Tyr	Leu	Ala	Gln	Trp	Ile	Glu	Ser	Gln	Pro	Trp	Asp	Ala	Ile	Asp	Leu	
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Asp	Asn	Pro	Gln	Asp	Arg	Ala	Gln	Ala	Thr	Gln	Leu	Leu	Glu	Gly	Leu	
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Val	Gln	Glu	Leu	Gln	Lys	Lys	Ala	Glu	His	Gln	Val	Gly	Glu	Asp	Gly	
65							70								80	

ttt	tta	ctg	aag	atc	aag	ctg	ggg	cac	tac	gcc	acg	cag	ctc	cag	aaa	288
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Phe	Leu	Leu	Lys	Ile	Lys	Leu	Gly	His	Tyr	Ala	Thr	Gln	Leu	Gln	Lys		
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Thr	Tyr	Asp	Arg	Cys	Pro	Leu	Glu	Leu	Val	Arg	Cys	Ile	Arg	His	Ile		
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ctg	tac	aat	gaa	cag	agg	ctg	gtc	cga	gaa	gcc	aac	aat	tgc	agc	tct		384
Leu	Tyr	Asn	Glu	Gln	Arg	Leu	Val	Arg	Glu	Ala	Asn	Asn	Cys	Ser	Ser		
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ccg	gct	ggg	atc	ctg	gtt	gac	gcc	atg	tcc	cag	aag	cac	ctt	cag	atc		432
Pro	Ala	Gly	Ile	Leu	Val	Asp	Ala	Met	Ser	Gln	Lys	His	Leu	Gln	Ile		
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Asn	Gln	Thr	Phe	Glu	Glu	Leu	Arg	Leu	Val	Thr	Gln	Asp	Thr	Glu	Asn		
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Glu	Leu	Lys	Lys	Leu	Gln	Gln	Thr	Gln	Glu	Tyr	Phe	Ile	Ile	Gln	Tyr		
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Gln	Glu	Ser	Leu	Arg	Ile	Gln	Ala	Gln	Phe	Ala	Gln	Leu	Ala	Gln	Leu		
			180					185					190				
agc	ccc	cag	gag	cgt	ctg	agc	cgg	gag	acg	gcc	ctc	cag	cag	aag	cag		624
Ser	Pro	Gln	Glu	Arg	Leu	Ser	Arg	Glu	Thr	Ala	Leu	Gln	Gln	Lys	Gln		
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Tyr	Arg	Val	Glu	Leu	Ala	Glu	Lys	His	Gln	Lys	Thr	Leu	Gln	Leu	Leu		
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Arg	Lys	Gln	Gln	Thr	Ile	Ile	Leu	Asp	Asp	Glu	Leu	Ile	Gln	Trp	Lys		
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cgg	cgg	cag	cag	ctg	gcc	ggg	aac	ggc	ggg	ccc	ccc	gag	ggc	agc	ctg		816
Arg	Arg	Gln	Gln	Leu	Ala	Gly	Asn	Gly	Gly	Pro	Pro	Glu	Gly	Ser	Leu		
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gac	gtg	cta	cag	tcc	tgg	tgt	gag	aag	ttg	gcc	gag	atc	atc	tgg	cag		864
Asp	Val	Leu	Gln	Ser	Trp	Cys	Glu	Lys	Leu	Ala	Glu	Ile	Ile	Trp	Gln		
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aac	cgg	cag	cag	atc	cgc	agg	gct	gag	cac	ctc	tgc	cag	cag	ctg	ccc		912
Asn	Arg	Gln	Gln	Ile	Arg	Arg	Ala	Glu	His	Leu	Cys	Gln	Gln	Leu	Pro		
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Asn	Leu	Val	Phe	Leu	Ala	Gln	Lys	Leu	Phe	Asn	Asn	Ser	Ser	Ser	His		
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Leu	Glu	Asp	Tyr	Ser	Gly	Leu	Ser	Val	Ser	Trp	Ser	Gln	Phe	Asn	Arg		
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Glu	Asn	Leu	Pro	Gly	Trp	Asn	Tyr	Thr	Phe	Trp	Gln	Trp	Phe	Asp	Gly		
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Arg	Pro	Lys	Asp	Glu	Val	Phe	Ser	Lys	Tyr	Tyr	Thr	Pro	Val	Leu	Ala		
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aaa	gct	gtt	gat	gga	tat	gtg	aaa	cca	cag	atc	aag	caa	gtg	gtc	cct	2112	
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Tyr Leu Ala Gln Trp Ile Glu Ser Gln Pro Trp Asp Ala Ile Asp Leu
 35 40 45

Asp Asn Pro Gln Asp Arg Ala Gln Ala Thr Gln Leu Leu Glu Gly Leu
 50 55 60

Val Gln Glu Leu Gln Lys Lys Ala Glu His Gln Val Gly Glu Asp Gly
 65 70 75 80

Phe Leu Leu Lys Ile Lys Leu Gly His Tyr Ala Thr Gln Leu Gln Lys
 85 90 95

Thr Tyr Asp Arg Cys Pro Leu Glu Leu Val Arg Cys Ile Arg His Ile
 100 105 110

Leu Tyr Asn Glu Gln Arg Leu Val Arg Glu Ala Asn Asn Cys Ser Ser
 115 120 125

Pro Ala Gly Ile Leu Val Asp Ala Met Ser Gln Lys His Leu Gln Ile
 130 135 140

Asn Gln Thr Phe Glu Glu Leu Arg Leu Val Thr Gln Asp Thr Glu Asn
 145 150 155 160

Glu Leu Lys Lys Leu Gln Gln Thr Gln Glu Tyr Phe Ile Ile Gln Tyr
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Gln Glu Ser Leu Arg Ile Gln Ala Gln Phe Ala Gln Leu Ala Gln Leu
 180 185 190

Ser Pro Gln Glu Arg Leu Ser Arg Glu Thr Ala Leu Gln Gln Lys Gln
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Val Ser Leu Glu Ala Trp Leu Gln Arg Glu Ala Gln Thr Leu Gln Gln
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Tyr Arg Val Glu Leu Ala Glu Lys His Gln Lys Thr Leu Gln Leu Leu
 225 230 235 240

Arg Lys Gln Gln Thr Ile Ile Leu Asp Asp Glu Leu Ile Gln Trp Lys
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Arg Arg Gln Gln Leu Ala Gly Asn Gly Gly Pro Pro Glu Gly Ser Leu
 260 265 270

Asp Val Leu Gln Ser Trp Cys Glu Lys Leu Ala Glu Ile Ile Trp Gln
 275 280 285

Asn Arg Gln Gln Ile Arg Arg Ala Glu His Leu Cys Gln Gln Leu Pro
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Ile Pro Gly Pro Val Glu Glu Met Leu Ala Glu Val Asn Ala Thr Ile
 305 310 315 320

Thr Asp Ile Ile Ser Ala Leu Val Thr Ser Thr Phe Ile Ile Glu Lys
 325 330 335

Gln Pro Pro Gln Val Leu Lys Thr Gln Thr Lys Phe Ala Ala Thr Val
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Arg Leu Leu Val Gly Gly Lys Leu Asn Val His Met Asn Pro Pro Gln
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Val Lys Ala Thr Ile Ile Ser Glu Gln Gln Ala Lys Ser Leu Leu Lys
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Asn Glu Asn Thr Arg Asn Glu Cys Ser Gly Glu Ile Leu Asn Asn Cys
 385 390 395 400

Cys Val Met Glu Tyr His Gln Ala Thr Gly Thr Leu Ser Ala His Phe
 405 410 415

Arg Asn Met Ser Leu Lys Arg Ile Lys Arg Ala Asp Arg Arg Gly Ala
 420 425 430

Glu Ser Val Thr Glu Glu Lys Phe Thr Val Leu Phe Glu Ser Gln Phe
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Ser Val Gly Ser Asn Glu Leu Val Phe Gln Val Lys Thr Leu Ser Leu
 450 455 460

Pro Val Val Val Ile Val His Gly Ser Gln Asp His Asn Ala Thr Ala
 465 470 475 480

Thr Val Leu Trp Asp Asn Ala Phe Ala Glu Pro Gly Arg Val Pro Phe
 485 490 495

Ala Val Pro Asp Lys Val Leu Trp Pro Gln Leu Cys Glu Ala Leu Asn
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Met Lys Phe Lys Ala Glu Val Gln Ser Asn Arg Gly Leu Thr Lys Glu
 515 520 525

Asn Leu Val Phe Leu Ala Gln Lys Leu Phe Asn Asn Ser Ser Ser His
 530 535 540

Leu Glu Asp Tyr Ser Gly Leu Ser Val Ser Trp Ser Gln Phe Asn Arg
 545 550 555 560

Glu Asn Leu Pro Gly Trp Asn Tyr Thr Phe Trp Gln Trp Phe Asp Gly
 565 570 575

Val Met Glu Val Leu Lys Lys His His Lys Pro His Trp Asn Asp Gly
 580 585 590

Ala Ile Leu Gly Phe Val Asn Lys Gln Gln Ala His Asp Leu Leu Ile
 595 600 605

Asn Lys Pro Asp Gly Thr Phe Leu Leu Arg Phe Ser Asp Ser Glu Ile
 610 615 620

Gly Gly Ile Thr Ile Ala Trp Lys Phe Asp Ser Pro Glu Arg Asn Leu
 625 630 635 640

Trp Asn Leu Lys Pro Phe Thr Thr Arg Asp Phe Ser Ile Arg Ser Leu
 645 650 655

Ala Asp Arg Leu Gly Asp Leu Ser Tyr Leu Ile Tyr Val Phe Pro Asp
 660 665 670

Arg Pro Lys Asp Glu Val Phe Ser Lys Tyr Tyr Thr Pro Val Leu Ala
 675 680 685

Lys Ala Val Asp Gly Tyr Val Lys Pro Gln Ile Lys Gln Val Val Pro
 690 695 700

Glu Phe Val Asn Ala Ser Ala Asp Ala Gly Gly Ser Ser Ala Thr Tyr
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Met Asp Gln Ala Pro Ser Pro Ala Val Cys Pro Gln Ala Pro Tyr Asn
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Met Tyr Pro Gln Asn Pro Asp His Val Leu Asp Gln Asp Gly Glu Phe
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Asp Leu Asp Glu Thr Met Asp Val Ala Arg His Val Glu Glu Leu Leu

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Tyr Leu Ser Gln Trp Ile Glu Ser Gln Ala Trp Asp Ser Val Asp Leu	
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Asp Asn Pro Gln Glu Asn Ile Lys Ala Thr Gln Leu Leu Glu Gly Leu	
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Val Gln Glu Leu Gln Lys Lys Ala Glu His Gln Val Gly Glu Asp Gly	
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Phe Leu Leu Lys Ile Lys Leu Gly His Tyr Ala Thr Gln Leu Gln Asn	
85 90 95	
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gag tta aaa aag ctg cag cag act cag gag tac ttc atc atc cag tac Glu Leu Lys Lys Leu Gln Gln Thr Gln Glu Tyr Phe Ile Ile Gln Tyr 165 170 175	528
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agc ccc cag gag cgt ctg agc cgg gag acg gcc ctc cag cag aag cag Ser Pro Gln Glu Arg Leu Ser Arg Glu Thr Ala Leu Gln Gln Lys Gln 195 200 205	624
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Cys	Val	Met	Glu	Tyr	His	Gln	Ala	Thr	Gly	Thr	Leu	Ser	Ala	His	Phe	
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Glu	Ser	Val	Thr	Glu	Glu	Lys	Phe	Thr	Ile	Leu	Phe	Glu	Ser	Gln	Phe	
			435				440					445				
agt	gtt	ggg	gga	aat	gag	ctg	gtt	ttt	caa	gtc	aag	acc	ctg	tcc	ctg	1392
Ser	Val	Gly	Gly	Asn	Glu	Leu	Val	Phe	Gln	Val	Lys	Thr	Leu	Ser	Leu	
			450				455				460					
cca	gtg	gtg	gtg	atc	gtt	cat	ggc	agc	cag	gac	aac	aat	gcg	acg	gcc	1440
Pro	Val	Val	Val	Ile	Val	His	Gly	Ser	Gln	Asp	Asn	Asn	Ala	Thr	Ala	
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act	gtt	ctc	tgg	gac	aat	gct	ttt	gca	gag	cct	ggc	agg	gtg	cca	ttt	1488
Thr	Val	Leu	Trp	Asp	Asn	Ala	Phe	Ala	Glu	Pro	Gly	Arg	Val	Pro	Phe	
				485				490					495			
gcc	gtg	cct	gac	aaa	gtg	ctg	tgg	cca	cag	ctg	tgt	gag	gcg	ctc	aac	1536
Ala	Val	Pro	Asp	Lys	Val	Leu	Trp	Pro	Gln	Leu	Cys	Glu	Ala	Leu	Asn	
			500					505					510			
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Met	Lys	Phe	Lys	Ala	Glu	Val	Gln	Ser	Asn	Arg	Gly	Leu	Thr	Lys	Glu	
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aac	ctc	gtg	ttc	ctg	gcg	cag	aaa	ctg	ttc	aac	aac	agc	agc	agc	cac	1632
Asn	Leu	Val	Phe	Leu	Ala	Gln	Lys	Leu	Phe	Asn	Asn	Ser	Ser	Ser	His	
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ctg	gag	gac	tac	agt	ggc	ctg	tct	gtg	tcc	tgg	tcc	cag	ttc	aac	agg	1680
Leu	Glu	Asp	Tyr	Ser	Gly	Leu	Ser	Val	Ser	Trp	Ser	Gln	Phe	Asn	Arg	
					550					555					560	

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gtg atg gaa gtg tta aaa aaa cat ctc aag cct cat tgg aat gat ggg	1776
Val Met Glu Val Leu Lys Lys His Leu Lys Pro His Trp Asn Asp Gly	
580 585 590	
gcc att ttg ggg ttt gta aac aag caa cag gcc cat gac cta ctc att	1824
Ala Ile Leu Gly Phe Val Asn Lys Gln Gln Ala His Asp Leu Leu Ile	
595 600 605	
aac aag cca gat ggg acc ttc ctc ctg aga ttc agt gac tca gaa att	1872
Asn Lys Pro Asp Gly Thr Phe Leu Leu Arg Phe Ser Asp Ser Glu Ile	
610 615 620	
ggc ggc atc acc att gct tgg aag ttt gat tct cag gaa aga atg ttt	1920
Gly Gly Ile Thr Ile Ala Trp Lys Phe Asp Ser Gln Glu Arg Met Phe	
625 630 635 640	
tgg aat ctg atg cct ttt acc acc aga gac ttc tcc att cgg tcc cta	1968
Trp Asn Leu Met Pro Phe Thr Thr Arg Asp Phe Ser Ile Arg Ser Leu	
645 650 655	
gcc gac cgc ttg gga gac ttg aat tac ctt atc tac gtg ttt cct gat	2016
Ala Asp Arg Leu Gly Asp Leu Asn Tyr Leu Ile Tyr Val Phe Pro Asp	
660 665 670	
cgg cca aaa gat gaa gta tac tcc aaa tac tac aca cca gtt ccc tgc	2064
Arg Pro Lys Asp Glu Val Tyr Ser Lys Tyr Tyr Thr Pro Val Pro Cys	
675 680 685	
gag tct gct act gct aaa gct gtt gat gga tac gtg aag cca cag atc	2112
Glu Ser Ala Thr Ala Lys Ala Val Asp Gly Tyr Val Lys Pro Gln Ile	
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Lys Gln Val Val Pro Glu Phe Val Asn Ala Ser Ala Asp Ala Gly Gly	
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ggc agc gcc acg tac atg gac cag gcc ccc tcc cca gct gtg tgt ccc	2208
Gly Ser Ala Thr Tyr Met Asp Gln Ala Pro Ser Pro Ala Val Cys Pro	
725 730 735	
cag gct cac tat aac atg tac cca cag aac cct gac tca gtc ctt gac	2256
Gln Ala His Tyr Asn Met Tyr Pro Gln Asn Pro Asp Ser Val Leu Asp	
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acc gat ggg gac ttc gat ctg gag gac aca atg gac gta gcg cgg cgt	2304
Thr Asp Gly Asp Phe Asp Leu Glu Asp Thr Met Asp Val Ala Arg Arg	
755 760 765	
gtg gag gag ctc ctg ggc cgg cca atg gac agt cag tgg atc ccg cac	2352

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gca caa tcg tga
 Ala Gln Ser
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2364

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<400> 4

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Tyr Leu Ser Gln Trp Ile Glu Ser Gln Ala Trp Asp Ser Val Asp Leu
 35 40 45

Asp Asn Pro Gln Glu Asn Ile Lys Ala Thr Gln Leu Leu Glu Gly Leu
 50 55 60

Val Gln Glu Leu Gln Lys Lys Ala Glu His Gln Val Gly Glu Asp Gly
 65 70 75 80

Phe Leu Leu Lys Ile Lys Leu Gly His Tyr Ala Thr Gln Leu Gln Asn
 85 90 95

Thr Tyr Asp Arg Cys Pro Met Glu Leu Val Arg Cys Ile Arg His Ile
 100 105 110

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 115 120 125

Pro Ala Gly Ser Leu Ala Asp Ala Met Ser Gln Lys His Leu Gln Ile
 130 135 140

Asn Gln Thr Phe Glu Glu Leu Arg Leu Val Thr Gln Asp Thr Glu Asn
 145 150 155 160

Arg Leu Leu Val Gly Gly Lys Leu Asn Val His Met Asn Pro Pro Gln
355 360 365

Val Lys Ala Thr Ile Ile Ser Glu Gln Gln Ala Lys Ser Leu Leu Lys
 370 375 380

Asn Glu Asn Thr Arg Asn Asp Tyr Ser Gly Glu Ile Leu Asn Asn Cys
 385 390 395 400

Cys Val Met Glu Tyr His Gln Ala Thr Gly Thr Leu Ser Ala His Phe
 405 410 415

Arg Asn Met Ser Leu Lys Arg Ile Lys Arg Ser Asp Arg Arg Gly Ala
 420 425 430

Glu Ser Val Thr Glu Glu Lys Phe Thr Ile Leu Phe Glu Ser Gln Phe
 435 440 445

Ser Val Gly Gly Asn Glu Leu Val Phe Gln Val Lys Thr Leu Ser Leu
 450 455 460

Pro Val Val Val Ile Val His Gly Ser Gln Asp Asn Asn Ala Thr Ala
 465 470 475 480

Thr Val Leu Trp Asp Asn Ala Phe Ala Glu Pro Gly Arg Val Pro Phe
 485 490 495

Ala Val Pro Asp Lys Val Leu Trp Pro Gln Leu Cys Glu Ala Leu Asn
 500 505 510

Met Lys Phe Lys Ala Glu Val Gln Ser Asn Arg Gly Leu Thr Lys Glu
 515 520 525

Asn Leu Val Phe Leu Ala Gln Lys Leu Phe Asn Asn Ser Ser Ser His
 530 535 540

Leu Glu Asp Tyr Ser Gly Leu Ser Val Ser Trp Ser Gln Phe Asn Arg
 545 550 555 560

Glu Asn Leu Pro Gly Arg Asn Tyr Thr Phe Trp Gln Trp Phe Asp Gly
 565 570 575

Val Met Glu Val Leu Lys Lys His Leu Lys Pro His Trp Asn Asp Gly
 580 585 590

Ala Ile Leu Gly Phe Val Asn Lys Gln Gln Ala His Asp Leu Leu Ile
 595 600 605

Asn Lys Pro Asp Gly Thr Phe Leu Leu Arg Phe Ser Asp Ser Glu Ile
 610 615 620

Gly Gly Ile Thr Ile Ala Trp Lys Phe Asp Ser Gln Glu Arg Met Phe
 625 630 635 640

Trp Asn Leu Met Pro Phe Thr Thr Arg Asp Phe Ser Ile Arg Ser Leu
 645 650 655

Ala Asp Arg Leu Gly Asp Leu Asn Tyr Leu Ile Tyr Val Phe Pro Asp
 660 665 670

Arg Pro Lys Asp Glu Val Tyr Ser Lys Tyr Tyr Thr Pro Val Pro Cys
 675 680 685

Glu Ser Ala Thr Ala Lys Ala Val Asp Gly Tyr Val Lys Pro Gln Ile
 690 695 700

Lys Gln Val Val Pro Glu Phe Val Asn Ala Ser Ala Asp Ala Gly Gly
 705 710 715 720

Gly Ser Ala Thr Tyr Met Asp Gln Ala Pro Ser Pro Ala Val Cys Pro
 725 730 735

Gln Ala His Tyr Asn Met Tyr Pro Gln Asn Pro Asp Ser Val Leu Asp
 740 745 750

Thr Asp Gly Asp Phe Asp Leu Glu Asp Thr Met Asp Val Ala Arg Arg
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Ala Gln Ser
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 cag atg caa gtg ttg tat ggg cag cat ttc ccc atc gag gtc cgg cac 96
 Gln Met Gln Val Leu Tyr Gly Gln His Phe Pro Ile Glu Val Arg His
 20 25 30
 tac ctg gcc cag tgg atc gag agc cag ccg tgg gat gct att gac ttg 144
 Tyr Leu Ala Gln Trp Ile Glu Ser Gln Pro Trp Asp Ala Ile Asp Leu
 35 40 45
 gat aat ccc cag gac cga ggt cag gcc acc caa ctc ctg gag ggc ctg 192
 Asp Asn Pro Gln Asp Arg Gly Gln Ala Thr Gln Leu Leu Glu Gly Leu
 50 55 60
 gtg cag gag ctg cag aag aag gcg gag cac cag gtg ggg gaa gat ggg 240
 Val Gln Glu Leu Gln Lys Lys Ala Glu His Gln Val Gly Glu Asp Gly
 65 70 75 80
 ttt ttg ctg aag atc aag ctg ggg cac tat gcc aca cag ctc cag aac 288
 Phe Leu Leu Lys Ile Lys Leu Gly His Tyr Ala Thr Gln Leu Gln Asn
 85 90 95
 acg tat gac cgc tgt ccc atg gag ctg gtt cgc tgt atc cgt cac att 336
 Thr Tyr Asp Arg Cys Pro Met Glu Leu Val Arg Cys Ile Arg His Ile
 100 105 110
 ctg tac aac gaa cag agg ctg gtt cgc gaa gcc aac aat tgc agc tcc 384
 Leu Tyr Asn Glu Gln Arg Leu Val Arg Glu Ala Asn Asn Cys Ser Ser
 115 120 125
 cct gct ggt gtc ctg gtt gac gcc atg tcc cag aag cac ctt cag atc 432
 Pro Ala Gly Val Leu Val Asp Ala Met Ser Gln Lys His Leu Gln Ile
 130 135 140
 aac caa agg ttt gag gag ctg cgc ctg atc aca cag gac acg gag aac 480
 Asn Gln Arg Phe Glu Glu Leu Arg Leu Ile Thr Gln Asp Thr Glu Asn
 145 150 155 160
 gag ctg aag aag ctg cag cag acc caa gag tac ttc atc atc cag tac 528
 Glu Leu Lys Lys Leu Gln Gln Thr Gln Glu Tyr Phe Ile Ile Gln Tyr
 165 170 175

cag gag agc ctg cgg atc caa gct cag ttt gcc cag ctg ggc cag ctg	576
Gln Glu Ser Leu Arg Ile Gln Ala Gln Phe Ala Gln Leu Gly Gln Leu	
180 185 190	
aac ccc cag gag cgc atg agc agg gag acg gcc ctc cag cag aag caa	624
Asn Pro Gln Glu Arg Met Ser Arg Glu Thr Ala Leu Gln Gln Lys Gln	
195 200 205	
gtg tcc ctg gag acc tgg ctg cag cga gag gca cag aca ctg cag cag	672
Val Ser Leu Glu Thr Trp Leu Gln Arg Glu Ala Gln Thr Leu Gln Gln	
210 215 220	
tac cga gtg gag ctg gct gag aag cac cag aag acc ctg cag ctg ctg	720
Tyr Arg Val Glu Leu Ala Glu Lys His Gln Lys Thr Leu Gln Leu Leu	
225 230 235 240	
cgg aag cag cag acc atc atc ctg gac gac gag ctg atc cag tgg aag	768
Arg Lys Gln Gln Thr Ile Ile Leu Asp Asp Glu Leu Ile Gln Trp Lys	
245 250 255	
cgg aga cag cag ctg gcc ggg aac ggg ggt ccc ccc gag ggc agc ctg	816
Arg Arg Gln Gln Leu Ala Gly Asn Gly Gly Pro Pro Glu Gly Ser Leu	
260 265 270	
gac gtg ctg cag tcc tgg tgt gag aag ctg gcc gag atc atc tgg cag	864
Asp Val Leu Gln Ser Trp Cys Glu Lys Leu Ala Glu Ile Ile Trp Gln	
275 280 285	
aac cgg cag cag atc cgc agg gct gag cac ctg tgc cag cag ctg ccc	912
Asn Arg Gln Gln Ile Arg Ala Glu His Leu Cys Gln Gln Leu Pro	
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atc cca ggc ccc gtg gag gag atg ctg gct gag gtc aac gcc acc atc	960
Ile Pro Gly Pro Val Glu Glu Met Leu Ala Glu Val Asn Ala Thr Ile	
305 310 315 320	
acg gac atc atc tca gct ctg gtc acc agc acg ttc atc atc gag aag	1008
Thr Asp Ile Ile Ser Ala Leu Val Thr Ser Thr Phe Ile Ile Glu Lys	
325 330 335	
cag cct cct cag gtc ctg aag acc cag acc aag ttt gcg gcc acc gtg	1056
Gln Pro Pro Gln Val Leu Lys Thr Gln Thr Lys Phe Ala Ala Thr Val	
340 345 350	
cgc ctg ctg gtg ggg gga aag ctg aat gtg cac atg aac ccc ccg cag	1104
Arg Leu Leu Val Gly Gly Lys Leu Asn Val His Met Asn Pro Pro Gln	
355 360 365	
gtg aag gcg acc atc atc agc gag cag cag gcc aag tcc ctg ctc aag	1152
Val Lys Ala Thr Ile Ile Ser Glu Gln Gln Ala Lys Ser Leu Leu Lys	
370 375 380	
aat gag aac acc cgc aat gag tgc agc ggc gag atc ctg aac aac tgt	1200

Asn Glu Asn Thr Arg Asn Glu Cys Ser Gly Glu Ile Leu Asn Asn Cys 385 390 395 400	
tgc gtc atg gag tac cac cag gcc act ggc acg ctc agc gcc cac ttc Cys Val Met Glu Tyr His Gln Ala Thr Gly Thr Leu Ser Ala His Phe 405 410 415	1248
aga aac atg tca ctg aaa aga atc aag cgc gcc gac agg cgt ggt gca Arg Asn Met Ser Leu Lys Arg Ile Lys Arg Ala Asp Arg Arg Gly Ala 420 425 430	1296
gag tcg gtg acg gag gag aag ttc aca gtc ctg ttt gag tct cag ttc Glu Ser Val Thr Glu Glu Lys Phe Thr Val Leu Phe Glu Ser Gln Phe 435 440 445	1344
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cct gtg gtc gtt atc gtc cat ggc agc cag gac cac aat gct act gcc Pro Val Val Val Ile Val His Gly Ser Gln Asp His Asn Ala Thr Ala 465 470 475 480	1440
acc gtg ctg tgg gac aat gcc ttt gct gag ccg ggc agg gtg cca ttt Thr Val Leu Trp Asp Asn Ala Phe Ala Glu Pro Gly Arg Val Pro Phe 485 490 495	1488
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gct atc ctg ggt ttc gtg aac aag caa cag gcc cac gac ctg ctc atc Ala Ile Leu Gly Phe Val Asn Lys Gln Gln Ala His Asp Leu Leu Ile 595 600 605	1824

aac aag ccg gac ggg acc ttc ctg ctg cgc ttc agt gac tcg gaa atc Asn Lys Pro Asp Gly Thr Phe Leu Leu Arg Phe Ser Asp Ser Glu Ile 610 615 620	1872
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tgg aat ctg aag cca ttc acg acg cga gat ttc tcc att cgg tcc ctg Trp Asn Leu Lys Pro Phe Thr Thr Arg Asp Phe Ser Ile Arg Ser Leu 645 650 655	1968
gcc gac cgg ctg ggg gac ctg aac tac ctt atc tac gtg ttc cca gac Ala Asp Arg Leu Gly Asp Leu Asn Tyr Leu Ile Tyr Val Phe Pro Asp 660 665 670	2016
cga ccc aag gac gag gtc ttt gcc aag tat tac act cct gta ctt gcg Arg Pro Lys Asp Glu Val Phe Ala Lys Tyr Tyr Thr Pro Val Leu Ala 675 680 685	2064
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gac cag gct cct tcc cca gtc gtg tgc cct caa cct cac tac aac atg Asp Gln Ala Pro Ser Pro Val Val Cys Pro Gln Pro His Tyr Asn Met 725 730 735	2208
tac cca ccc aac cct gac cct gtc ctt gac caa gat ggc gag ttt gac Tyr Pro Pro Asn Pro Asp Pro Val Leu Asp Gln Asp Gly Glu Phe Asp 740 745 750	2256
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Tyr Leu Ala Gln Trp Ile Glu Ser Gln Pro Trp Asp Ala Ile Asp Leu
 35 40 45

Asp Asn Pro Gln Asp Arg Gly Gln Ala Thr Gln Leu Leu Glu Gly Leu
 50 55 60

Val Gln Glu Leu Gln Lys Lys Ala Glu His Gln Val Gly Glu Asp Gly
 65 70 75 80

Phe Leu Leu Lys Ile Lys Leu Gly His Tyr Ala Thr Gln Leu Gln Asn
 85 90 95

Thr Tyr Asp Arg Cys Pro Met Glu Leu Val Arg Cys Ile Arg His Ile
 100 105 110

Leu Tyr Asn Glu Gln Arg Leu Val Arg Glu Ala Asn Asn Cys Ser Ser
 115 120 125

Pro Ala Gly Val Leu Val Asp Ala Met Ser Gln Lys His Leu Gln Ile
 130 135 140

Asn Gln Arg Phe Glu Glu Leu Arg Leu Ile Thr Gln Asp Thr Glu Asn
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Glu Leu Lys Lys Leu Gln Gln Thr Gln Glu Tyr Phe Ile Ile Gln Tyr
 165 170 175

Gln Glu Ser Leu Arg Ile Gln Ala Gln Phe Ala Gln Leu Gly Gln Leu
 180 185 190

Asn Pro Gln Glu Arg Met Ser Arg Glu Thr Ala Leu Gln Gln Lys Gln
 195 200 205

Val Ser Leu Glu Thr Trp Leu Gln Arg Glu Ala Gln Thr Leu Gln Gln
 210 215 220

Tyr Arg Val Glu Leu Ala Glu Lys His Gln Lys Thr Leu Gln Leu Leu
 225 230 235 240

Arg Lys Gln Gln Thr Ile Ile Leu Asp Asp Glu Leu Ile Gln Trp Lys
 245 250 255

Arg Arg Gln Gln Leu Ala Gly Asn Gly Gly Pro Pro Glu Gly Ser Leu
 260 265 270

Asp Val Leu Gln Ser Trp Cys Glu Lys Leu Ala Glu Ile Ile Trp Gln
 275 280 285

Asn Arg Gln Gln Ile Arg Arg Ala Glu His Leu Cys Gln Gln Leu Pro
 290 295 300

Ile Pro Gly Pro Val Glu Glu Met Leu Ala Glu Val Asn Ala Thr Ile
 305 310 315 320

Thr Asp Ile Ile Ser Ala Leu Val Thr Ser Thr Phe Ile Ile Glu Lys
 325 330 335

Gln Pro Pro Gln Val Leu Lys Thr Gln Thr Lys Phe Ala Ala Thr Val
 340 345 350

Arg Leu Leu Val Gly Gly Lys Leu Asn Val His Met Asn Pro Pro Gln
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Val Lys Ala Thr Ile Ile Ser Glu Gln Gln Ala Lys Ser Leu Leu Lys
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Asn Glu Asn Thr Arg Asn Glu Cys Ser Gly Glu Ile Leu Asn Asn Cys
 385 390 395 400

Cys Val Met Glu Tyr His Gln Ala Thr Gly Thr Leu Ser Ala His Phe
 405 410 415

Arg Asn Met Ser Leu Lys Arg Ile Lys Arg Ala Asp Arg Arg Gly Ala
 420 425 430

Glu Ser Val Thr Glu Glu Lys Phe Thr Val Leu Phe Glu Ser Gln Phe
 435 440 445

Ser Val Gly Ser Asn Glu Leu Val Phe Gln Val Lys Thr Leu Ser Leu
 450 455 460

Pro Val Val Val Ile Val His Gly Ser Gln Asp His Asn Ala Thr Ala
 465 470 475 480

Thr Val Leu Trp Asp Asn Ala Phe Ala Glu Pro Gly Arg Val Pro Phe
 485 490 495

Ala Val Pro Asp Lys Val Leu Trp Pro Gln Leu Cys Glu Ala Leu Asn
 500 505 510

Met Lys Phe Lys Ala Glu Val Gln Ser Asn Arg Gly Leu Thr Lys Glu
 515 520 525

Asn Leu Val Phe Leu Ala Gln Lys Leu Phe Asn Ile Ser Ser Asn His
 530 535 540

Leu Glu Asp Tyr Asn Ser Met Ser Val Ser Trp Ser Gln Phe Asn Arg
 545 550 555 560

Glu Asn Leu Pro Gly Trp Asn Tyr Thr Phe Trp Gln Trp Phe Asp Gly
 565 570 575

Val Met Glu Val Leu Lys Lys His His Lys Pro His Trp Asn Asp Gly
 580 585 590

Ala Ile Leu Gly Phe Val Asn Lys Gln Gln Ala His Asp Leu Leu Ile
 595 600 605

Asn Lys Pro Asp Gly Thr Phe Leu Leu Arg Phe Ser Asp Ser Glu Ile
 610 615 620

Gly Gly Ile Thr Ile Ala Trp Lys Phe Asp Ser Pro Asp Arg Asn Leu
 625 630 635 640

Trp Asn Leu Lys Pro Phe Thr Thr Arg Asp Phe Ser Ile Arg Ser Leu
 645 650 655

Ala Asp Arg Leu Gly Asp Leu Asn Tyr Leu Ile Tyr Val Phe Pro Asp
 660 665 670

Arg Pro Lys Asp Glu Val Phe Ala Lys Tyr Tyr Thr Pro Val Leu Ala
 675 680 685

Lys Ala Val Asp Gly Tyr Val Lys Pro Gln Ile Lys Gln Val Val Pro
 690 695 700

Glu Phe Val Asn Ala Ser Thr Asp Ala Gly Ala Ser Ala Thr Tyr Met
 705 710 715 720

Asp Gln Ala Pro Ser Pro Val Val Cys Pro Gln Pro His Tyr Asn Met
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Tyr Pro Pro Asn Pro Asp Pro Val Leu Asp Gln Asp Gly Glu Phe Asp
 740 745 750

Leu Asp Glu Ser Met Asp Val Ala Arg His Val Glu Glu Leu Leu Arg
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Phe Thr Ser Ala Arg Ser Ser Leu Ser
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Gln	Met	Gln	Ala	Leu	Tyr	Gly	Gln	His	Phe	Pro	Ile	Glu	Val	Arg	His	
			20					25					30			
tat	tta	tca	cag	tg	atc	gaa	agc	caa	gcc	tg	gac	tca	ata	gat	ctt	144
Tyr	Leu	Ser	Gln	Trp	Ile	Glu	Ser	Gln	Ala	Trp	Asp	Ser	Ile	Asp	Leu	
		35					40				45					
gat	aat	cca	cag	gag	aac	att	aag	gcc	acc	cag	ctc	ctg	gag	ggc	ctg	192
Asp	Asn	Pro	Gln	Glu	Asn	Ile	Lys	Ala	Thr	Gln	Leu	Leu	Glu	Gly	Leu	
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Val	Gln	Glu	Leu	Gln	Lys	Lys	Ala	Glu	His	Gln	Val	Gly	Glu	Asp	Gly	
65					70				75						80	
ttt	ttg	ctg	aag	atc	aag	ctg	ggg	cac	tat	gcc	aca	cag	ctc	cag	agc	288
Phe	Leu	Leu	Lys	Ile	Lys	Leu	Gly	His	Tyr	Ala	Thr	Gln	Leu	Gln	Ser	
				85					90					95		
acg	tac	gac	cg	tgc	ccc	atg	gag	ctg	gtt	cg	tgt	atc	cgg	cac	att	336
Thr	Tyr	Asp	Arg	Cys	Pro	Met	Glu	Leu	Val	Arg	Cys	Ile	Arg	His	Ile	
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Leu	Tyr	Asn	Glu	Gln	Arg	Leu	Val	Arg	Glu	Ala	Asn	Asn	Gly	Ser	Ser	
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cca	gct	gga	agt	ctt	gct	gac	gcc	atg	tcc	cag	aag	cac	ctt	cag	atc	432
Pro	Ala	Gly	Ser	Leu	Ala	Asp	Ala	Met	Ser	Gln	Lys	His	Leu	Gln	Ile	
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Asn	Gln	Thr	Phe	Glu	Glu	Leu	Arg	Leu	Ile	Thr	Gln	Asp	Thr	Glu	Asn	
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gag	ctg	aag	aag	ctg	cag	cag	acc	caa	gag	tac	ttc	atc	atc	cag	tac	528
Glu	Leu	Lys	Lys	Leu	Gln	Gln	Thr	Gln	Glu	Tyr	Phe	Ile	Ile	Gln	Tyr	
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cag	gag	agc	ctg	cg	atc	caa	gct	cag	ttt	gcc	cag	ctg	gga	cag	ctg	576
Gln	Glu	Ser	Leu	Arg	Ile	Gln	Ala	Gln	Phe	Ala	Gln	Leu	Gly	Gln	Leu	
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aac	ccc	cag	gag	cg	atg	agc	agg	gag	acg	gcc	ctc	cag	cag	aag	caa	624
Asn	Pro	Gln	Glu	Arg	Met	Ser	Arg	Glu	Thr	Ala	Leu	Gln	Gln	Lys	Gln	
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gtg	tcc	ctg	gag	acc	tg	ctg	cag	cga	gag	gca	cag	aca	ctg	cag	cag	672
Val	Ser	Leu	Glu	Thr	Trp	Leu	Gln	Arg	Glu	Ala	Gln	Thr	Leu	Gln	Gln	
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Tyr Arg Val Glu Leu Ala Glu Lys His Gln Lys Thr Leu Gln Leu Leu	
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Arg Lys Gln Gln Thr Ile Ile Leu Asp Asp Glu Leu Ile Gln Trp Lys	
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Arg Arg Gln Gln Leu Ala Gly Asn Gly Gly Pro Pro Glu Gly Ser Leu	
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Asp Val Leu Gln Ser Trp Cys Glu Lys Leu Ala Glu Ile Ile Trp Gln	
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Asn Arg Gln Gln Ile Arg Arg Ala Glu His Leu Cys Gln Gln Leu Pro	
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Ile Pro Gly Pro Val Glu Glu Met Leu Ala Glu Val Asn Ala Thr Ile	
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acg gac atc atc tca gcc ctg gtc acc agc acg ttc atc atc gag aag	1008
Thr Asp Ile Ile Ser Ala Leu Val Thr Ser Thr Phe Ile Ile Glu Lys	
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Gln Pro Pro Gln Val Leu Lys Thr Gln Thr Lys Phe Ala Ala Thr Val	
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Arg Leu Leu Val Gly Gly Lys Leu Asn Val His Met Asn Pro Pro Gln	
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Val Lys Ala Thr Ile Ile Ser Glu Gln Gln Ala Lys Ser Leu Leu Lys	
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Asn Glu Asn Thr Arg Asn Asp Tyr Ser Gly Glu Ile Leu Asn Asn Cys	
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Cys Val Met Glu Tyr His Gln Ala Thr Gly Thr Leu Ser Ala His Phe	
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Arg Asn Met Ser Leu Lys Arg Ile Lys Arg Ser Asp Arg Arg Gly Ala	
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Glu	Ser	Val	Thr	Glu	Glu	Lys	Phe	Thr	Ile	Leu	Phe	Asp	Ser	Gln	Phe	
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Ser	Val	Gly	Gly	Asn	Glu	Leu	Val	Phe	Gln	Val	Lys	Thr	Leu	Ser	Leu	
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Pro	Val	Val	Val	Ile	Val	His	Gly	Ser	Gln	Asp	Asn	Asn	Ala	Thr	Ala	
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Thr	Val	Leu	Trp	Asp	Asn	Ala	Phe	Ala	Glu	Pro	Gly	Arg	Val	Pro	Phe	
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gcc	gtg	cct	gac	aag	gtg	ctg	tgg	ccg	cag	ctg	tgt	gaa	gcg	ctc	aac	1536
Ala	Val	Pro	Asp	Lys	Val	Leu	Trp	Pro	Gln	Leu	Cys	Glu	Ala	Leu	Asn	
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atg	aaa	ttc	aag	gct	gaa	gta	cag	agc	aac	cgg	ggc	ttg	acc	aag	gag	1584
Met	Lys	Phe	Lys	Ala	Glu	Val	Gln	Ser	Asn	Arg	Gly	Leu	Thr	Lys	Glu	
		515					520					525				
aac	ctc	gtg	ttc	ctg	gca	cag	aaa	ctg	ttc	aac	atc	agc	agc	aac	cac	1632
Asn	Leu	Val	Phe	Leu	Ala	Gln	Lys	Leu	Phe	Asn	Ile	Ser	Ser	Asn	His	
		530				535					540					
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Leu	Glu	Asp	Tyr	Asn	Ser	Met	Ser	Val	Ser	Trp	Ser	Gln	Phe	Asn	Arg	
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Glu	Asn	Leu	Pro	Gly	Arg	Asn	Tyr	Thr	Phe	Trp	Gln	Trp	Phe	Asp	Gly	
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gtg	atg	gaa	gta	ttg	aaa	aaa	cat	ctc	aag	cct	cac	tgg	aat	gat	ggg	1776
Val	Met	Glu	Val	Leu	Lys	Lys	His	Leu	Lys	Pro	His	Trp	Asn	Asp	Gly	
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Ala	Ile	Leu	Gly	Phe	Val	Asn	Lys	Gln	Gln	Ala	His	Asp	Leu	Leu	Ile	
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Asn	Lys	Pro	Asp	Gly	Thr	Phe	Leu	Leu	Arg	Phe	Ser	Asp	Ser	Glu	Ile	
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Gly	Gly	Ile	Thr	Ile	Ala	Trp	Lys	Phe	Asp	Ser	Gln	Glu	Arg	Met	Phe	
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tgg	aat	ctg	atg	cct	ttt	acc	act	aga	gac	ttc	tct	atc	cgg	tcc	ctc	1968
Trp	Asn	Leu	Met	Pro	Phe	Thr	Thr	Arg	Asp	Phe	Ser	Ile	Arg	Ser	Leu	
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 Arg Pro Lys Asp Glu Val Tyr Ser Lys Tyr Tyr Thr Pro Val Pro Cys
 675 680 685

gag ccc gca act gcg aaa gca gct gac gga tac gtg aag cca cag atc 2112
 Glu Pro Ala Thr Ala Lys Ala Ala Asp Gly Tyr Val Lys Pro Gln Ile
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 Lys Gln Val Val Pro Glu Phe Ala Asn Ala Ser Thr Asp Ala Gly Ser
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ggc gcc acc tac atg gat cag gct cct tcc cca gtc gtg tgc cct cag 2208
 Gly Ala Thr Tyr Met Asp Gln Ala Pro Ser Pro Val Val Cys Pro Gln
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 Ala His Tyr Asn Met Tyr Pro Pro Asn Pro Asp Ser Val Leu Asp Thr
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Tyr Leu Ser Gln Trp Ile Glu Ser Gln Ala Trp Asp Ser Ile Asp Leu

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Asp Asn Pro Gln Glu Asn Ile Lys Ala Thr Gln Leu Leu Glu Gly Leu
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Val Gln Glu Leu Gln Lys Lys Ala Glu His Gln Val Gly Glu Asp Gly
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Phe Leu Leu Lys Ile Lys Leu Gly His Tyr Ala Thr Gln Leu Gln Ser
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Thr Tyr Asp Arg Cys Pro Met Glu Leu Val Arg Cys Ile Arg His Ile
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Leu Tyr Asn Glu Gln Arg Leu Val Arg Glu Ala Asn Asn Gly Ser Ser
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Pro Ala Gly Ser Leu Ala Asp Ala Met Ser Gln Lys His Leu Gln Ile
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Asn Gln Thr Phe Glu Glu Leu Arg Leu Ile Thr Gln Asp Thr Glu Asn
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Glu Leu Lys Lys Leu Gln Gln Thr Gln Glu Tyr Phe Ile Ile Gln Tyr
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Gln Glu Ser Leu Arg Ile Gln Ala Gln Phe Ala Gln Leu Gly Gln Leu
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Asn Pro Gln Glu Arg Met Ser Arg Glu Thr Ala Leu Gln Gln Lys Gln
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Val Ser Leu Glu Thr Trp Leu Gln Arg Glu Ala Gln Thr Leu Gln Gln
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Tyr Arg Val Glu Leu Ala Glu Lys His Gln Lys Thr Leu Gln Leu Leu
 225 230 235 240

Arg Lys Gln Gln Thr Ile Ile Leu Asp Asp Glu Leu Ile Gln Trp Lys
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Arg Arg Gln Gln Leu Ala Gly Asn Gly Gly Pro Pro Glu Gly Ser Leu
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Asp Val Leu Gln Ser Trp Cys Glu Lys Leu Ala Glu Ile Ile Trp Gln
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Ile Pro Gly Pro Val Glu Glu Met Leu Ala Glu Val Asn Ala Thr Ile
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Thr Asp Ile Ile Ser Ala Leu Val Thr Ser Thr Phe Ile Ile Glu Lys
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Gln Pro Pro Gln Val Leu Lys Thr Gln Thr Lys Phe Ala Ala Thr Val
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Arg Leu Leu Val Gly Gly Lys Leu Asn Val His Met Asn Pro Pro Gln
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Val Lys Ala Thr Ile Ile Ser Glu Gln Gln Ala Lys Ser Leu Leu Lys
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Asn Glu Asn Thr Arg Asn Asp Tyr Ser Gly Glu Ile Leu Asn Asn Cys
 385 390 395 400

Cys Val Met Glu Tyr His Gln Ala Thr Gly Thr Leu Ser Ala His Phe
 405 410 415

Arg Asn Met Ser Leu Lys Arg Ile Lys Arg Ser Asp Arg Arg Gly Ala
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Glu Ser Val Thr Glu Glu Lys Phe Thr Ile Leu Phe Asp Ser Gln Phe
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Ser Val Gly Gly Asn Glu Leu Val Phe Gln Val Lys Thr Leu Ser Leu
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Pro Val Val Val Ile Val His Gly Ser Gln Asp Asn Asn Ala Thr Ala

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Ala Val Pro	Asp 500	Lys Val Leu Trp	Pro 505	Gln Leu Cys Glu	Ala Leu Asn	
Met Lys Phe	Lys 515	Ala Glu Val	Gln 520	Ser Asn Arg Gly	Leu Thr Lys Glu	
Asn Leu Val	Phe 530	Leu Ala	Gln 535	Lys Leu Phe Asn	Ile Ser Ser Asn His	
Leu Glu Asp	Tyr Asn 545	Ser Met Ser Val	Ser 555	Trp Ser Gln Phe Asn	Arg 560	
Glu Asn Leu	Pro Gly 565	Arg Asn Tyr Thr	Phe 570	Trp Gln Trp Phe Asp	Gly 575	
Val Met Glu	Val 580	Leu Lys Lys His	Leu 585	Lys Pro His Trp Asn Asp	Gly 590	
Ala Ile Leu	Gly 595	Phe Val Asn	Lys 600	Gln Gln Ala His Asp	Leu Leu Ile 605	
Asn Lys Pro	Asp Gly 610	Thr Phe Leu Leu	Arg 615	Phe Ser Asp Ser Glu Ile		
Gly Gly Ile	Thr Ile 625	Ala Trp Lys Phe Asp	Ser 635	Gln Glu Arg Met Phe		
Trp Asn Leu	Met Pro 645	Phe Thr Thr Arg Asp	Phe 650	Ser Ile Arg Ser Leu		
Ala Asp Arg	Leu Gly 660	Asp Leu Asn Tyr	Leu 665	Ile Tyr Val Phe Pro Asp		
Arg Pro Lys	Asp Glu 675	Val Tyr Ser Lys Tyr Tyr	Thr 680	Pro Val Pro Cys		

Glu Pro Ala Thr Ala Lys Ala Ala Asp Gly Tyr Val Lys Pro Gln Ile
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Lys Gln Val Val Pro Glu Phe Ala Asn Ala Ser Thr Asp Ala Gly Ser
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Gly Ala Thr Tyr Met Asp Gln Ala Pro Ser Pro Val Val Cys Pro Gln
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Ala His Tyr Asn Met Tyr Pro Pro Asn Pro Asp Ser Val Leu Asp Thr
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 Gln Met Gln Val Leu Tyr Gly Gln His Phe Pro Ile Glu Val Arg His
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 Tyr Leu Ala Gln Trp Ile Glu Ser Gln Pro Trp Asp Ala Ile Asp Leu
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ttt ttg ctg aag atc aag ctg ggg cac tat gcc aca cag ctc cag aac Phe Leu Leu Lys Ile Lys Leu Gly His Tyr Ala Thr Gln Leu Gln Asn 85 90 95	288
acg tat gac cgc tgt ccc atg gag ctg gtt cgc tgt atc cgt cac att Thr Tyr Asp Arg Cys Pro Met Glu Leu Val Arg Cys Ile Arg His Ile 100 105 110	336
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cct gct ggt gtc ctg gtt gac gcc atg tcc cag aag cac ctt cag atc Pro Ala Gly Val Leu Val Asp Ala Met Ser Gln Lys His Leu Gln Ile 130 135 140	432
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cgg aag cag cag acc atc atc ctg gac gac gag ctg atc cag tgg aag Arg Lys Gln Gln Thr Ile Ile Leu Asp Asp Glu Leu Ile Gln Trp Lys 245 250 255	768
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Asp	Val	Leu	Gln	Ser	Trp	Cys	Glu	Lys	Leu	Ala	Glu	Ile	Ile	Trp	Gln	
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Asn	Arg	Gln	Gln	Ile	Arg	Arg	Ala	Glu	Arg	Leu	Cys	Gln	Gln	Leu	Pro	
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Ile	Pro	Gly	Pro	Val	Glu	Glu	Met	Leu	Ala	Glu	Val	Asn	Ala	Thr	Ile	
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Gln	Pro	Pro	Gln	Val	Leu	Lys	Thr	Gln	Thr	Lys	Phe	Ala	Ala	Thr	Val	
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Asn	Glu	Asn	Thr	Arg	Asn	Glu	Cys	Ser	Gly	Glu	Ile	Leu	Asn	Asn	Cys	
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tgc	gtc	atg	gag	tac	cac	cag	gcc	act	ggc	acg	ctc	agc	gcc	cac	ttc	1248
Cys	Val	Met	Glu	Tyr	His	Gln	Ala	Thr	Gly	Thr	Leu	Ser	Ala	His	Phe	
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Arg	Asn	Met	Ser	Leu	Lys	Arg	Ile	Lys	Arg	Ala	Asp	Arg	Arg	Gly	Ala	
			420					425					430			
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cct	gtg	gtc	gtt	atc	gtc	cat	ggc	agc	cag	gac	cac	aat	gct	act	gcc	1440
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Thr	Val	Leu	Trp	Asp	Asn	Ala	Phe	Ala	Glu	Pro	Gly	Arg	Val	Pro	Phe	
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Met	Lys	Phe	Lys	Ala	Glu	Val	Gln	Ser	Asn	Arg	Gly	Leu	Thr	Lys	Glu	
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Asn	Leu	Val	Phe	Leu	Ala	Gln	Lys	Leu	Phe	Asn	Ile	Ser	Ser	Asn	His	
	530					535					540					
ctc	gag	gac	tac	aac	agc	atg	tct	gtg	tcc	tgg	tcc	cag	ttc	aac	cgg	1680
Leu	Glu	Asp	Tyr	Asn	Ser	Met	Ser	Val	Ser	Trp	Ser	Gln	Phe	Asn	Arg	
545					550				555						560	
gag	aac	ttg	ccc	ggc	tgg	aac	tac	acc	ttc	tgg	cag	tgg	ttc	gac	ggg	1728
Glu	Asn	Leu	Pro	Gly	Trp	Asn	Tyr	Thr	Phe	Trp	Gln	Trp	Phe	Asp	Gly	
				565				570						575		
gtg	atg	gag	gtg	ctg	aag	aag	cac	cat	aag	ccc	cat	tgg	aat	gat	ggg	1776
Val	Met	Glu	Val	Leu	Lys	Lys	His	His	Lys	Pro	His	Trp	Asn	Asp	Gly	
			580					585					590			
gct	atc	ctg	ggt	ttc	gtg	aac	aag	caa	cag	gcc	cac	gac	ctg	ctc	atc	1824
Ala	Ile	Leu	Gly	Phe	Val	Asn	Lys	Gln	Gln	Ala	His	Asp	Leu	Leu	Ile	
		595					600					605				
aac	aag	ccg	gac	ggg	acc	ttc	ctg	ctg	cgc	ttc	agt	gac	tcg	gaa	atc	1872
Asn	Lys	Pro	Asp	Gly	Thr	Phe	Leu	Leu	Arg	Phe	Ser	Asp	Ser	Glu	Ile	
	610					615				620						
ggg	ggc	atc	acc	att	gct	tgg	aag	ttt	gac	tct	ccg	gac	cga	aac	ctc	1920
Gly	Gly	Ile	Thr	Ile	Ala	Trp	Lys	Phe	Asp	Ser	Pro	Asp	Arg	Asn	Leu	
625					630				635						640	
tgg	aat	ctg	aag	cca	ttc	acg	acg	cga	gat	ttc	tcc	att	cgg	tcc	ctg	1968
Trp	Asn	Leu	Lys	Pro	Phe	Thr	Thr	Arg	Asp	Phe	Ser	Ile	Arg	Ser	Leu	
				645				650					655			
gcc	gac	cgg	ctg	ggg	gac	ctg	aac	tac	ctt	atc	tac	gtg	ttc	cca	gac	2016
Ala	Asp	Arg	Leu	Gly	Asp	Leu	Asn	Tyr	Leu	Ile	Tyr	Val	Phe	Pro	Asp	
			660					665					670			
cga	ccc	aag	gac	gag	gtc	ttt	gcc	aag	tat	tac	act	cct	gta	ctt	gcg	2064
Arg	Pro	Lys	Asp	Glu	Val	Phe	Ala	Lys	Tyr	Tyr	Thr	Pro	Val	Leu	Ala	
		675					680					685				
aaa	gca	gtt	gac	gga	tac	gtg	aag	cca	cag	atc	aag	caa	gtg	gtc	cct	2112

Lys Ala Val Asp Gly Tyr Val Lys Pro Gln Ile Lys Gln Val Val Pro
 690 695 700
 gag ttc gtc aat gca ttc aca gat gcc gga gcc agc gcc acc tac atg 2160
 Glu Phe Val Asn Ala Phe Thr Asp Ala Gly Ala Ser Ala Thr Tyr Met
 705 710 715 720
 gac cag gct cct tcc cca gtc gtg tgc cct caa cct cac tac aac atg 2208
 Asp Gln Ala Pro Ser Pro Val Val Cys Pro Gln Pro His Tyr Asn Met
 725 730 735
 tac cca ccc aac cct gac cct gtc ctt gac caa gat ggc gag ttt gac 2256
 Tyr Pro Pro Asn Pro Asp Pro Val Leu Asp Gln Asp Gly Glu Phe Asp
 740 745 750
 ctg gat gag agc atg gat gtt gcc agg cac gtg gaa gaa ctt tta cgc 2304
 Leu Asp Glu Ser Met Asp Val Ala Arg His Val Glu Glu Leu Leu Arg
 755 760 765
 cgg ccc atg gac agt ctc gac gcc cgc ctc tcc cca cct gct ggt ctc 2352
 Arg Pro Met Asp Ser Leu Asp Ala Arg Leu Ser Pro Pro Ala Gly Leu
 770 775 780
 ttc acc tcc gct aga agc tcc ctg tcc tga 2382
 Phe Thr Ser Ala Arg Ser Ser Leu Ser
 785 790

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 <211> 793
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> activated STAT5A

<400> 10

Met Ala Gly Trp Ile Gln Ala Gln Gln Leu Gln Gly Asp Ala Leu Arg
 1 5 10 15

Gln Met Gln Val Leu Tyr Gly Gln His Phe Pro Ile Glu Val Arg His
 20 25 30

Tyr Leu Ala Gln Trp Ile Glu Ser Gln Pro Trp Asp Ala Ile Asp Leu
 35 40 45

Asp Asn Pro Gln Asp Arg Gly Gln Ala Thr Gln Leu Leu Glu Gly Leu
 50 55 60

Asp Val Leu Gln Ser Trp Cys Glu Lys Leu Ala Glu Ile Ile Trp Gln

275		280		285
Asn Arg Gln Gln Ile Arg Arg Ala Glu Arg Leu Cys Gln Gln Leu Pro				
290		295		300
Ile Pro Gly Pro Val Glu Glu Met Leu Ala Glu Val Asn Ala Thr Ile				
305		310		315 320
Thr Asp Ile Ile Ser Ala Leu Val Thr Ser Thr Phe Ile Ile Glu Lys				
		325		330 335
Gln Pro Pro Gln Val Leu Lys Thr Gln Thr Lys Phe Ala Ala Thr Val				
		340		345 350
Arg Leu Leu Val Gly Gly Lys Leu Asn Val His Met Asn Pro Pro Gln				
		355		360 365
Val Lys Ala Thr Ile Ile Ser Glu Gln Gln Ala Lys Ser Leu Leu Lys				
		370		375 380
Asn Glu Asn Thr Arg Asn Glu Cys Ser Gly Glu Ile Leu Asn Asn Cys				
385		390		395 400
Cys Val Met Glu Tyr His Gln Ala Thr Gly Thr Leu Ser Ala His Phe				
		405		410 415
Arg Asn Met Ser Leu Lys Arg Ile Lys Arg Ala Asp Arg Arg Gly Ala				
		420		425 430
Glu Ser Val Thr Glu Glu Lys Phe Thr Val Leu Phe Glu Ser Gln Phe				
		435		440 445
Ser Val Gly Ser Asn Glu Leu Val Phe Gln Val Lys Thr Leu Ser Leu				
		450		455 460
Pro Val Val Val Ile Val His Gly Ser Gln Asp His Asn Ala Thr Ala				
465		470		475 480
Thr Val Leu Trp Asp Asn Ala Phe Ala Glu Pro Gly Arg Val Pro Phe				
		485		490 495

Ala Val Pro Asp Lys Val Leu Trp Pro Gln Leu Cys Glu Ala Leu Asn
 500 505 510

Met Lys Phe Lys Ala Glu Val Gln Ser Asn Arg Gly Leu Thr Lys Glu
 515 520 525

Asn Leu Val Phe Leu Ala Gln Lys Leu Phe Asn Ile Ser Ser Asn His
 530 535 540

Leu Glu Asp Tyr Asn Ser Met Ser Val Ser Trp Ser Gln Phe Asn Arg
 545 550 555 560

Glu Asn Leu Pro Gly Trp Asn Tyr Thr Phe Trp Gln Trp Phe Asp Gly
 565 570 575

Val Met Glu Val Leu Lys Lys His His Lys Pro His Trp Asn Asp Gly
 580 585 590

Ala Ile Leu Gly Phe Val Asn Lys Gln Gln Ala His Asp Leu Leu Ile
 595 600 605

Asn Lys Pro Asp Gly Thr Phe Leu Leu Arg Phe Ser Asp Ser Glu Ile
 610 615 620

Gly Gly Ile Thr Ile Ala Trp Lys Phe Asp Ser Pro Asp Arg Asn Leu
 625 630 635 640

Trp Asn Leu Lys Pro Phe Thr Thr Arg Asp Phe Ser Ile Arg Ser Leu
 645 650 655

Ala Asp Arg Leu Gly Asp Leu Asn Tyr Leu Ile Tyr Val Phe Pro Asp
 660 665 670

Arg Pro Lys Asp Glu Val Phe Ala Lys Tyr Tyr Thr Pro Val Leu Ala
 675 680 685

Lys Ala Val Asp Gly Tyr Val Lys Pro Gln Ile Lys Gln Val Val Pro
 690 695 700

Glu Phe Val Asn Ala Phe Thr Asp Ala Gly Ala Ser Ala Thr Tyr Met
705 710 715 720

Asp Gln Ala Pro Ser Pro Val Val Cys Pro Gln Pro His Tyr Asn Met
725 730 735

Tyr Pro Pro Asn Pro Asp Pro Val Leu Asp Gln Asp Gly Glu Phe Asp
740 745 750

Leu Asp Glu Ser Met Asp Val Ala Arg His Val Glu Glu Leu Leu Arg
755 760 765

Arg Pro Met Asp Ser Leu Asp Ala Arg Leu Ser Pro Pro Ala Gly Leu
770 775 780

Phe Thr Ser Ala Arg Ser Ser Leu Ser
785 790

<210> 11
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> consensus

<400> 11
gatccgaatt ccaggaattc agatc

25

<210> 12
<211> 2382
<212> DNA
<213> Artificial Sequence

<220>
<223> activated STAT5A

<220>
<221> CDS
<222> (1)..(2382)
<223>

<400> 12
atg gcg ggc tgg att cag gcc cag cag ctt cag gga gat gcc ctg cgc
Met Ala Gly Trp Ile Gln Ala Gln Gln Leu Gln Gly Asp Ala Leu Arg
1 5 10 15

48

cag atg caa gtg ttg tat ggg cag cat ttc ccc atc gag gtc cgg cac Gln Met Gln Val Leu Tyr Gly Gln His Phe Pro Ile Glu Val Arg His 20 25 30	96
tac ctg gcc cag tgg atc gag agc cag ccg tgg gat gct att gac ttg Tyr Leu Ala Gln Trp Ile Glu Ser Gln Pro Trp Asp Ala Ile Asp Leu 35 40 45	144
gat aat ccc cag gac cga ggt cag gcc acc caa ctc ctg gag ggc ctg Asp Asn Pro Gln Asp Arg Gly Gln Ala Thr Gln Leu Leu Glu Gly Leu 50 55 60	192
gtg cag gag ctg cag aag aag gcg gag cac cag gtg ggg gaa gat ggg Val Gln Glu Leu Gln Lys Lys Ala Glu His Gln Val Gly Glu Asp Gly 65 70 75 80	240
ttt ttg ctg aag atc aag ctg ggg cac tat gcc aca cag ctc cag aac Phe Leu Leu Lys Ile Lys Leu Gly His Tyr Ala Thr Gln Leu Gln Asn 85 90 95	288
acg tat gac cgc tgt ccc atg gag ctg gtt cgc tgt atc cgt cac att Thr Tyr Asp Arg Cys Pro Met Glu Leu Val Arg Cys Ile Arg His Ile 100 105 110	336
ctg tac aac gaa cag agg ctg gtt cgc gaa gcc aac aat tgc agc tcc Leu Tyr Asn Glu Gln Arg Leu Val Arg Glu Ala Asn Asn Cys Ser Ser 115 120 125	384
cct gct ggt gtc ctg gtt gac gcc atg tcc cag aag cac ctt cag atc Pro Ala Gly Val Leu Val Asp Ala Met Ser Gln Lys His Leu Gln Ile 130 135 140	432
aac caa agg ttt gag ggg ctg cgc ctg atc aca cag gac acg gag aac Asn Gln Arg Phe Glu Gly Leu Arg Leu Ile Thr Gln Asp Thr Glu Asn 145 150 155 160	480
gag ctg aag aag ctg cag cag acc caa gag tac ttc atc atc cag tac Glu Leu Lys Lys Leu Gln Gln Thr Gln Glu Tyr Phe Ile Ile Gln Tyr 165 170 175	528
cag gag agc ctg cgg atc caa gct cag ttt gcc cag ctg ggc cag ctg Gln Glu Ser Leu Arg Ile Gln Ala Gln Phe Ala Gln Leu Gly Gln Leu 180 185 190	576
aac ccc cag gag cgc atg agc agg gag acg gcc ctc cag cag aag caa Asn Pro Gln Glu Arg Met Ser Arg Glu Thr Ala Leu Gln Gln Lys Gln 195 200 205	624
gtg tcc ctg gag acc tgg ctg cag cga gag gca cag aca ctg cag cag Val Ser Leu Glu Thr Trp Leu Gln Arg Glu Ala Gln Thr Leu Gln Gln 210 215 220	672
tac cga gtg gag ctg gct gag aag cac cag aag acc ctg cag ctg ctg Tyr Arg Val Glu Leu Ala Glu Lys His Gln Lys Thr Leu Gln Leu Leu	720

225					230					235					240	
cgg aag cag cag acc atc atc ctg gac gac gag ctg atc cag tgg aag																768
Arg Lys Gln Gln Thr Ile Ile Leu Asp Asp Glu Leu Ile Gln Trp Lys																
				245					250						255	
cgg aga cag cag ctg gcc ggg aac ggg ggt ccc ccc gag ggc agc ctg																816
Arg Arg Gln Gln Leu Ala Gly Asn Gly Gly Pro Pro Glu Gly Ser Leu																
			260					265						270		
gac gtg ctg cag tcc tgg tgt gag aag ctg gcc gag atc atc tgg cag																864
Asp Val Leu Gln Ser Trp Cys Glu Lys Leu Ala Glu Ile Ile Trp Gln																
			275					280						285		
aac cgg cag cag atc cgc agg gct gag cac ctg tgc cag cag ctg ccc																912
Asn Arg Gln Gln Ile Arg Arg Ala Glu His Leu Cys Gln Gln Leu Pro																
			290				295						300			
atc cca ggc ccc gtg gag gag atg ctg gct gag gtc aac gcc acc atc																960
Ile Pro Gly Pro Val Glu Glu Met Leu Ala Glu Val Asn Ala Thr Ile																
			305			310				315					320	
acg gac atc atc tca gct ctg gtc acc agc acg ttc atc atc gag aag																1008
Thr Asp Ile Ile Ser Ala Leu Val Thr Ser Thr Phe Ile Ile Glu Lys																
				325					330						335	
cag cct cct cag gtc ctg aag acc cag acc aag ttt gcg gcc acc gtg																1056
Gln Pro Pro Gln Val Leu Lys Thr Gln Thr Lys Phe Ala Ala Thr Val																
			340					345						350		
cgc ctg ctg gtg ggg gga aag ctg aat gtg cac atg aac ccc ccg cag																1104
Arg Leu Leu Val Gly Gly Lys Leu Asn Val His Met Asn Pro Pro Gln																
			355				360						365			
gtg aag gcg acc atc atc agc gag cag cag gcc aag tcc ctg ctc aag																1152
Val Lys Ala Thr Ile Ile Ser Glu Gln Gln Ala Lys Ser Leu Leu Lys																
			370			375				380						
aat gag aac acc cgc aat gag tgc agc ggc gag atc ctg aac aac tgt																1200
Asn Glu Asn Thr Arg Asn Glu Cys Ser Gly Glu Ile Leu Asn Asn Cys																
			385			390				395					400	
tgc gtc atg gag tac cac cag gcc act ggc acg ctc agc gcc cac ttc																1248
Cys Val Met Glu Tyr His Gln Ala Thr Gly Thr Leu Ser Ala His Phe																
				405					410					415		
aga aac atg tca ctg aaa aga atc aag cgc gcc gac agg cgt ggt gca																1296
Arg Asn Met Ser Leu Lys Arg Ile Lys Arg Ala Asp Arg Gly Ala																
			420					425						430		
gag tcg gtg acg gag gag aag ttc aca gtc ctg ttt gag tct cag ttc																1344
Glu Ser Val Thr Glu Glu Lys Phe Thr Val Leu Phe Glu Ser Gln Phe																
			435				440						445			

agc gtt ggc agc aac gag ctg gtg ttc cag gtg aag acc ctg tcc ctc Ser Val Gly Ser Asn Glu Leu Val Phe Gln Val Lys Thr Leu Ser Leu 450 455 460	1392
cct gtg gtc gtt atc gtc cat ggc agc cag gac cac aat gct act gcc Pro Val Val Val Ile Val His Gly Ser Gln Asp His Asn Ala Thr Ala 465 470 475 480	1440
acc gtg ctg tgg gac aat gcc ttt gct gag ccg ggc agg gtg cca ttt Thr Val Leu Trp Asp Asn Ala Phe Ala Glu Pro Gly Arg Val Pro Phe 485 490 495	1488
gct gtg cct gac aag gtg ctg tgg ccg cag ctg tgt gaa gcg ctc aac Ala Val Pro Asp Lys Val Leu Trp Pro Gln Leu Cys Glu Ala Leu Asn 500 505 510	1536
atg aaa ttc aag gct gaa gta cag agc aac cgg ggc ttg acc aaa gag Met Lys Phe Lys Ala Glu Val Gln Ser Asn Arg Gly Leu Thr Lys Glu 515 520 525	1584
aac ctc gtg ttc ctg gca cag aaa ctg ttc aac atc agc agc aac cac Asn Leu Val Phe Leu Ala Gln Lys Leu Phe Asn Ile Ser Ser Asn His 530 535 540	1632
ctc gag gac tac aac agc atg tct gtg tcc tgg tcc cag ttc aac cgg Leu Glu Asp Tyr Asn Ser Met Ser Val Ser Trp Ser Gln Phe Asn Arg 545 550 555 560	1680
gag aac ttg ccc ggc tgg aac tac acc ttc tgg cag tgg ttc gac ggg Glu Asn Leu Pro Gly Trp Asn Tyr Thr Phe Trp Gln Trp Phe Asp Gly 565 570 575	1728
gtg atg gag gtg ctg aag aag cac cat aag ccc cat tgg aat gat ggg Val Met Glu Val Leu Lys Lys His His Lys Pro His Trp Asn Asp Gly 580 585 590	1776
gct atc ctg ggt ttc gtg aac aag caa cag gcc cac gac ctg ctc atc Ala Ile Leu Gly Phe Val Asn Lys Gln Gln Ala His Asp Leu Leu Ile 595 600 605	1824
aac aag ccg gac ggg acc ttc ctg ctg cgc ttc agt gac tcg gaa atc Asn Lys Pro Asp Gly Thr Phe Leu Leu Arg Phe Ser Asp Ser Glu Ile 610 615 620	1872
ggg ggc atc acc att gct tgg aag ttt gac tct ccg gac cga aac ctc Gly Gly Ile Thr Ile Ala Trp Lys Phe Asp Ser Pro Asp Arg Asn Leu 625 630 635 640	1920
tgg aat ctg aag cca ttc acg acg cga gat ttc tcc att cgg tcc ctg Trp Asn Leu Lys Pro Phe Thr Thr Arg Asp Phe Ser Ile Arg Ser Leu 645 650 655	1968
gcc gac cgg ctg ggg gac ctg aac tac ctt atc tac gtg ttc cca gac Ala Asp Arg Leu Gly Asp Leu Asn Tyr Leu Ile Tyr Val Phe Pro Asp 660 665 670 675 680 685 690 695 700	2016

660	665	670	
cga ccc aag gac gag gtc ttt gcc aag tat tac act cct gta ctt gcg			2064
Arg Pro Lys Asp Glu Val Phe Ala Lys Tyr Tyr Thr Pro Val Leu Ala			
675	680	685	
aaa gca gtt gac gga tac gtg aag cca cag atc aag caa gtg gtc cct			2112
Lys Ala Val Asp Gly Tyr Val Lys Pro Gln Ile Lys Gln Val Val Pro			
690	695	700	
gag ttc gtc aat gca ttc aca gat gcc gga gcc agc gcc acc tac atg			2160
Glu Phe Val Asn Ala Phe Thr Asp Ala Gly Ala Ser Ala Thr Tyr Met			
705	710	715	720
gac cag gct cct tcc cca gtc gtg tgc cct caa cct cac tac aac atg			2208
Asp Gln Ala Pro Ser Pro Val Val Cys Pro Gln Pro His Tyr Asn Met			
725	730	735	
tac cca ccc aac cct gac cct gtc ctt gac caa gat ggc gag ttt gac			2256
Tyr Pro Pro Asn Pro Asp Pro Val Leu Asp Gln Asp Gly Glu Phe Asp			
740	745	750	
ctg gat gag agc atg gat gtt gcc agg cac gtg gaa gaa ctt tta cgc			2304
Leu Asp Glu Ser Met Asp Val Ala Arg His Val Glu Glu Leu Leu Arg			
755	760	765	
cgg ccc atg gac agt ctc gac gcc cgc ctc tcc cca cct gct ggt ctc			2352
Arg Pro Met Asp Ser Leu Asp Ala Arg Leu Ser Pro Pro Ala Gly Leu			
770	775	780	
ttc acc tcc gct aga agc tcc ctg tcc tga			2382
Phe Thr Ser Ala Arg Ser Ser Leu Ser			
785	790		

<210> 13
 <211> 793
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> activated STAT5A

<400> 13

Met	Ala	Gly	Trp	Ile	Gln	Ala	Gln	Gln	Leu	Gln	Gly	Asp	Ala	Leu	Arg
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Gln	Met	Gln	Val	Leu	Tyr	Gly	Gln	His	Phe	Pro	Ile	Glu	Val	Arg	His
			20					25					30		

Tyr Leu Ala Gln Trp Ile Glu Ser Gln Pro Trp Asp Ala Ile Asp Leu
 35 40 45

Asp Asn Pro Gln Asp Arg Gly Gln Ala Thr Gln Leu Leu Glu Gly Leu
 50 55 60

Val Gln Glu Leu Gln Lys Lys Ala Glu His Gln Val Gly Glu Asp Gly
 65 70 75 80

Phe Leu Leu Lys Ile Lys Leu Gly His Tyr Ala Thr Gln Leu Gln Asn
 85 90 95

Thr Tyr Asp Arg Cys Pro Met Glu Leu Val Arg Cys Ile Arg His Ile
 100 105 110

Leu Tyr Asn Glu Gln Arg Leu Val Arg Glu Ala Asn Asn Cys Ser Ser
 115 120 125

Pro Ala Gly Val Leu Val Asp Ala Met Ser Gln Lys His Leu Gln Ile
 130 135 140

Asn Gln Arg Phe Glu Gly Leu Arg Leu Ile Thr Gln Asp Thr Glu Asn
 145 150 155 160

Glu Leu Lys Lys Leu Gln Gln Thr Gln Glu Tyr Phe Ile Ile Gln Tyr
 165 170 175

Gln Glu Ser Leu Arg Ile Gln Ala Gln Phe Ala Gln Leu Gly Gln Leu
 180 185 190

Asn Pro Gln Glu Arg Met Ser Arg Glu Thr Ala Leu Gln Gln Lys Gln
 195 200 205

Val Ser Leu Glu Thr Trp Leu Gln Arg Glu Ala Gln Thr Leu Gln Gln
 210 215 220

Tyr Arg Val Glu Leu Ala Glu Lys His Gln Lys Thr Leu Gln Leu Leu
 225 230 235 240

Arg Lys Gln Gln Thr Ile Ile Leu Asp Asp Glu Leu Ile Gln Trp Lys
 245 250 255

Arg Arg Gln Gln Leu Ala Gly Asn Gly Gly Pro Pro Glu Gly Ser Leu
 260 265 270

Asp Val Leu Gln Ser Trp Cys Glu Lys Leu Ala Glu Ile Ile Trp Gln
 275 280 285

Asn Arg Gln Gln Ile Arg Arg Ala Glu His Leu Cys Gln Gln Leu Pro
 290 295 300

Ile Pro Gly Pro Val Glu Glu Met Leu Ala Glu Val Asn Ala Thr Ile
 305 310 315 320

Thr Asp Ile Ile Ser Ala Leu Val Thr Ser Thr Phe Ile Ile Glu Lys
 325 330 335

Gln Pro Pro Gln Val Leu Lys Thr Gln Thr Lys Phe Ala Ala Thr Val
 340 345 350

Arg Leu Leu Val Gly Gly Lys Leu Asn Val His Met Asn Pro Pro Gln
 355 360 365

Val Lys Ala Thr Ile Ile Ser Glu Gln Gln Ala Lys Ser Leu Leu Lys
 370 375 380

Asn Glu Asn Thr Arg Asn Glu Cys Ser Gly Glu Ile Leu Asn Asn Cys
 385 390 395 400

Cys Val Met Glu Tyr His Gln Ala Thr Gly Thr Leu Ser Ala His Phe
 405 410 415

Arg Asn Met Ser Leu Lys Arg Ile Lys Arg Ala Asp Arg Arg Gly Ala
 420 425 430

Glu Ser Val Thr Glu Glu Lys Phe Thr Val Leu Phe Glu Ser Gln Phe
 435 440 445

Ser Val Gly Ser Asn Glu Leu Val Phe Gln Val Lys Thr Leu Ser Leu
 450 455 460

Pro Val Val Val Ile Val His Gly Ser Gln Asp His Asn Ala Thr Ala
465 470 475 480

Thr Val Leu Trp Asp Asn Ala Phe Ala Glu Pro Gly Arg Val Pro Phe
485 490 495

Ala Val Pro Asp Lys Val Leu Trp Pro Gln Leu Cys Glu Ala Leu Asn
500 505 510

Met Lys Phe Lys Ala Glu Val Gln Ser Asn Arg Gly Leu Thr Lys Glu
515 520 525

Asn Leu Val Phe Leu Ala Gln Lys Leu Phe Asn Ile Ser Ser Asn His
530 535 540

Leu Glu Asp Tyr Asn Ser Met Ser Val Ser Trp Ser Gln Phe Asn Arg
545 550 555 560

Glu Asn Leu Pro Gly Trp Asn Tyr Thr Phe Trp Gln Trp Phe Asp Gly
565 570 575

Val Met Glu Val Leu Lys Lys His His Lys Pro His Trp Asn Asp Gly
580 585 590

Ala Ile Leu Gly Phe Val Asn Lys Gln Gln Ala His Asp Leu Leu Ile
595 600 605

Asn Lys Pro Asp Gly Thr Phe Leu Leu Arg Phe Ser Asp Ser Glu Ile
610 615 620

Gly Gly Ile Thr Ile Ala Trp Lys Phe Asp Ser Pro Asp Arg Asn Leu
625 630 635 640

Trp Asn Leu Lys Pro Phe Thr Thr Arg Asp Phe Ser Ile Arg Ser Leu
645 650 655

Ala Asp Arg Leu Gly Asp Leu Asn Tyr Leu Ile Tyr Val Phe Pro Asp
660 665 670

Arg Pro Lys Asp Glu Val Phe Ala Lys Tyr Tyr Thr Pro Val Leu Ala

675

680

685

Lys Ala Val Asp Gly Tyr Val Lys Pro Gln Ile Lys Gln Val Val Pro
 690 695 700

Glu Phe Val Asn Ala Phe Thr Asp Ala Gly Ala Ser Ala Thr Tyr Met
 705 710 715 720

Asp Gln Ala Pro Ser Pro Val Val Cys Pro Gln Pro His Tyr Asn Met
 725 730 735

Tyr Pro Pro Asn Pro Asp Pro Val Leu Asp Gln Asp Gly Glu Phe Asp
 740 745 750

Leu Asp Glu Ser Met Asp Val Ala Arg His Val Glu Glu Leu Leu Arg
 755 760 765

Arg Pro Met Asp Ser Leu Asp Ala Arg Leu Ser Pro Pro Ala Gly Leu
 770 775 780

Phe Thr Ser Ala Arg Ser Ser Leu Ser
 785 790